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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,631	11/24/2003	Mark Mathias	H-205755	4256

7590 12/28/2005

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EXAMINER	
KALAFUT, STEPHEN J	
ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/720,631	MATHIAS ET AL.	
	Examiner	Art Unit	
	Stephen J. Kalafut	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-64* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-13,15-22,24-31 and 33-64* is/are rejected.

7)☒ Claim(s) *5,14,23 and 32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *24 November 2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 48-64 are rejected under 35 U.S.C. 102(b) as being anticipated by Oda *et al.* (US 4,551,220).

Oda *et al.* disclose a gas diffusion electrode material (column 2, lines 10-14) made of carbon powder, which is partially graphitized (column 3, lines 36-38), and PTFE (column 3, lines 17-20). A "liquid lubricant" is used to mix these solids, but is then driven off (column 3, lines 23-26). The carbon content is at most 90% by weight (column 3, line 68 through column 4, line 2), which would mean that the PTFE content is at least 10% by weight. The porosity of the gas diffusion material is 40 to 95% (column 4, lines 31-32). The material forms a layer with a thickness of between 20 to 500 microns, preferably between 30 and 300 microns (column 4, lines 40-42). Because the materials, porosities and thickness range fall within or largely overlap those presently disclosed, the other recited properties, namely the water vapor permeance and bulk density, would inherently accrue.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6-13, 15-22, 24-31 and 33-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda *et al.* in view of Matlock *et al.* (US 6,261,711).

Oda *et al.* teach that gas diffusion electrodes as useful as fuel and oxygen electrodes in fuel cells (column 1, lines 9-11), but do not specify proton exchange membrane (PEM) fuel cells or their particular structure. Matlock *et al.* disclose the structure of a PEM fuel cell, which includes an electrolyte between two catalyst layers, with gas diffusion layers each disposed on the catalyst layers, on the opposite side thereof from the electrolyte (column 1, line 58 through column 2, line 4). Because Matlock *et al.* teach that gas diffusion layers are useful in PEM fuel cells, it would be obvious to use the gas diffusion layers of Oda *et al.* in a PEM fuel cell as disclosed by Matlock *et al.*

Claims 5, 14, 23 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art cited either herein or by applicant does not teach the use of a cathode diffusion layer having different values of the recited properties from the anode diffusion layer.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Isono *et al.* (US 6,365,293), Hamada *et al.* (US 6,899,971), Yoshida *et al.* (US 2003/0064279) and Hayashi *et al.* (US 2005/0173244) disclose various fuel cell gas diffusion layers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sjk